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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/825,694	Applicant(s) HARPER ET AL.	
	Examiner AARON M. GUERTIN	Art Unit 2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _17 December 2007_.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _8-39_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _8-39_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _16 June 2004_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _1/05/2005, 11/18/2005, 1/20/2006, and 5/09/2006_.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of group II (claims 8-38 and 39) in the reply filed on 12/17/2007 is acknowledged.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 1/05/2005 is being considered by the examiner.

3. The information disclosure statement (IDS) submitted on 11/18/2005 is being considered by the examiner.

However US Publication 2003/174136 A1 (Emberling et al.) is NOT being considered because it is an incorrect citation number.

However US Publication 2002/118217 A1 (Fujiki) is NOT being considered because it is an incorrect citation number.

4. The information disclosure statement (IDS) submitted on 1/20/2006 is being considered by the examiner.

However, US Patent No. 6,389,830 (Brunner et al.) is NOT being considered because patent number does not mach the inventor and the reference is related to solar refrigeration, not optimizing graphics operations.

5. The information disclosure statement (IDS) submitted on 5/09/2006 is being considered by the examiner.

Claim Objections

6. Claims 12, 13, 20, 21, 22, 23, 31, and 36 are objected to because of the following informalities: Appropriate correction is required.

7. Claim 12 (line 2) contains wherein the word “Calculating” is capitalized. Claims are only to have a capital letter at the beginning and only contain 1 sentence (using 1 period).

8. Claim 13 (line 2) contains wherein the word “Calculating” is capitalized. Claims are only to have a capital letter at the beginning and only contain 1 sentence (using 1 period).

9. Claim 20 (line 3) contains a period after the disclosed limitation of “**the additional steps of using a cache to determine if said rendered image is available in memory**.” (line 2). As there are following limitations, there must not be ending punctuation except that of which does not end the sentence unless no following limitations are to be considered.

Claim 20 (line 4) contains wherein the word “Using” is capitalized.

Claim 20 (line 6) contains wherein the word “Using” is capitalized.

Claim 20 (line 7) contains wherein the word “Using” is capitalized.

Claim 20 (line 8) is missing the ending punctuation.

Claims are only to have a capital letter at the beginning and only contain 1 sentence (using 1 period).

10. Claim 21(line 3) contains wherein the word “Using” is capitalized.

Claim 21 (line 5) contains wherein the word “Using” is capitalized.

Claim 21 (line 6) contains wherein the word “Using” is capitalized.

Claim 21 (line 7) is missing the ending punctuation.

Claims are only to have a capital letter at the beginning and only contain 1 sentence (using 1 period).

11. Claim 22 (line 3) contains wherein the word “Using” is capitalized.

Claim 22 (line 4) contains wherein the word “Using” is capitalized.

Claim 22 (line 5) is missing the ending punctuation.

Claims are only to have a capital letter at the beginning and only contain 1 sentence (using 1 period).

12. Claim 23 (line 3) contains wherein the word “Under” is capitalized.

Claim 23 (line 4) contains wherein the word “Under” is capitalized.

Claim 23 (line 7) contains wherein the word “Under” is capitalized.

Claim 23 (line 14) is missing the ending punctuation.

Claims are only to have a capital letter at the beginning and only contain 1 sentence (using 1 period).

13. Claim 31 (line 3) contains wherein the word “Under” is capitalized.

Claim 23 (line 4) contains wherein the word “Under” is capitalized.

Claims are only to have a capital letter at the beginning and only contain 1 sentence (using 1 period).

14. Claim 36 (line 3) is missing the ending punctuation.

Claims are only to have a capital letter at the beginning and only contain 1 sentence (using 1 period).

Appropriate correction is required.

Claim Rejections - 35 USC § 112

15. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

16. Claims 30 and 38 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As per claim 30, it is dependent upon claim 23 which claims more than one GPU program. As in claim 30, it contains the limitation of "without running <u>that</u> GPU program". The term "that" is ambiguous and as it could be used to describe a plurality of GPU programs and actually limits down to one, without defining which GPU program is being described. Therefore claim 30 is indefinite for failing to point out which program "that GPU program" is.

As per claim 38, it is dependent upon claim 31 which claims more than one node. As in claim 38, it contains the limitation of "without computing <u>that</u> node". The term "that"

is ambiguous and as it could be used to describe a plurality of nodes and actually limits down to one, without defining which node is being described. Therefore claim 38 is indefinite for failing to point out which node "that node" is.

Claim Rejections - 35 USC § 103

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

18. Claims 8-22 and 31-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Publication No.: US 2003/0076329 A1 (Beda) in view of U.S. Patent No. 5,896,139 (Strauss).

19. As per claim 8, Beda teaches of a method of creating an image (graphic), said image represented by an image graph (tree structure), said image graph (tree structure) comprising one or more programs ([0011] and [0012]), inputs to those programs and outputs from those programs, the method comprising the steps of: **optimizing** ([0010]) **said image graph** (sub-graph) **by running software on a CPU** ([Fig. 1, (120)] and [0032] and [0073])**; compiling said image graph by running software on said CPU** ([0047] and [0048])**; rendering said image graph by running said compiled image graph, yielding a rendered image** ([Fig. 7], [0047], and [0048]). Beda teaches the limitations of claim 1 above; however, Beta fails to teach of wherein the method includes

one or more GPU programs, and wherein rendering an image is done by running the **compiled image graph**. Strauss teaches of a system and a method for optimizing a scene graph for optimizing the rendering of an image ([Column 1, lines 63-67] and [Column 2, lines 1-13]). Strauss further teaches of containing a graphics controller (GPU) wherein rendering an object by executing the steps in the scene graph ([Fig. 3], [Column 1, lines 63-67], [Column 2-1-13], and [Column 2- lines 34-44]. Beda teaches of optimizing the rendering of graphics through the optimization of storing and accessing information related to an image based upon a caching structure (scenic graph – ex. [0008]) dependent upon an animation engine (graphics processor). Considering Strauss teaches of a system and method for using scenic graphs in relation to image data but includes using extra processing power (graphics controller) and contains an optimization step (optimization of both the scene graph and rendering performance), it would have been obvious for one skilled in the art to have combine the teachings of Beda with those of Strauss. Doing so would provide the means for an image rendering system that optimizes the scene graph used for rendering the image, optimizing the rendering of the image (including having more processing power), and having a more structured storage and retrieval method.

20. As per claim 9, Beda and Strauss teach of the limitations of claim 8 above, however Beda fails to specifically teach of wherein the step of optimizing includes the step of **using a cache look-up to see if said rendered image is already in cache**. However, Beda does teach of system that maintains a cache and its visual information

including changes that occur within ([0015]). Considering that Beda teaches of maintaining a cache and optimizing the flow of information for visual information, further including wherein the changes of the cache are kept track of ([0010]), it would have been obvious to one skilled in the art to have checked the cache to see if the requested information has already been processed. It is well know to one skilled in the art to eliminate redundancy and as such this step is obvious.

21. As per claim 10, Beda teaches of the limitations of claim 8 above, however, Beda fails to specifically teach of wherein the step of optimizing includes the step of using **a cache look-up to see if said image graph has already been optimized and is in a memory**. Strauss teaches of wherein the scene graph is accessed and optimized ([Column 5, lines 50-67], [Column 6, lines 1-19], [Fig. 3], and [Fig. 5]). Even though in the cited disclosures it is not specifically stated wherein the scene graph is stored within the cache and a cache look-up function engages to see if the graph has been optimized or not, it would have been obvious to one skilled in the art to have checked the cache to see if the graph had been optimized or has already been processed. It is well know to one skilled in the art to eliminate redundancy and as such this step is obvious.

22. As per claim 11, Beda teaches of wherein the step of optimizing includes the step of Calculating an intersection, said intersection representing an area where said **rendered image is both defined by said image graph and part of a region requested by a process running on said CPU that has requested creation of said**

image ([0011], [0012], and [0013] – Beda teach so wherein the data structure can be traversed for direct rendering or for preprocessing - both of these execute a rendering procedure within the processing unit wherein an the data is represented by the scene graph and by image data being rendered as it is called).

23. Regarding claim 12, it is similar in scope to claim 11 and is rejected under the same rationale.

24. Regarding claim 13, it is similar in scope to claims 11 and 12 and is rejected under the same rationale.

25. As per claim 14, Beda and Strauss both teach the limitations of claim 8, and Beda teaches the limitations of claim 11, however both Beda and Strauss fail to teach of comprising the step of, using said calculated intersection to **limit the number of pixels that require calculation during said rendering on said GPU**. Strauss does teach of the scene graph wherein each grouping of nodes corresponds to a part of the overall object being displayed ([Column 3 lines 33-50]). It would be obvious that since a node or grouping is responsible for just a part of the graphical information that when sending the information for that particular grouping through the graphics controller the information being sent is automatically already limited to what information is needed by that particular grouping.

26. Regarding claim 15, it is similar in scope to claim 14 and is rejected under the same rationale.

27. Regarding claim 16, it is similar in scope to claim 14 and 15 and is rejected under the same rationale.

28. As per claim 17, Beda and Strauss both teach the limitations of claim 8, and Beda teaches the limitations of claim 11, however both Beda and Strauss fail to teach teaches of further comprising the step of, using said calculated intersection to **limit the amount of memory necessary for storing said rendered image**. Beda does teach of having an intelligent caching system that processes visual information ([0010], [0011], [0012], and [0013]). The intelligence associates optimization and how that visual information is populated and used. Furthermore as disclosed within the paragraphs listed above, specific data handling methods are used to conserve resources ([0012]. Even though it is not specifically mentioned that the memory is limited, it would have been obvious to one skilled in the art that conserving resources also includes memory since over populating memory with data will bog down a system and not optimize processing in any nature.

29. Regarding claim 18, it is similar in scope to claim 17 and is rejected under the same rationale.

30. Regarding claim 19, it is similar in scope to claim 17 and 18 and is rejected under the same rationale.

31. As per claim 20, Beda and Strauss both teach the limitations of claim 8, and Strauss teaches **Using the CPU to determine if programs may be combined; Using the CPU to determine if said GPU** (graphics controller) **is capable of running a program that has been created by combining two other GPU programs** ([Column 5, lines 32-58], [Column 5, lines 50-67], and [Column 6, lines 1-22]). Strauss teaches the limitations of claim 23 above, however both fail to teach wherein said step of optimizing comprises **the additional step of using a cache to determine if said rendered image is available in memory and of Using the CPU to perform ROI/DOD intersections with respect to one or more of said programs.** Strauss does teach of wherein the optimization of the scene graph involves rearranging nodes based on their properties ([Fig. 5], [Column 5, lines 50-67], and [Column 6, lines 1-18]). Applicant defines ROI and DOD in [0117] in terms that they help the optimization of a section of data (according to shape). Considering each of the nodes have there own properties it would be obvious for one skilled in the art to have also termed each grouping of nodes that are rearranged in groups according to their properties (based on shape). Furthermore, it would have been obvious for one skilled in the art to have determined if an image or visual information would be ready for display or use within a program as without it being ready it would not be able to be displayed.

32. Regarding claim 21, it is similar in scope to claim 20 and is rejected under the same rationale.

33. Regarding claim 22, it is similar in scope to claim 20 and 21 and is rejected under the same rationale.

34. Regarding claim 31, Beda teaches of a method for creating a rendered image (graphic), the method comprising the steps of: **Under control of said CPU, creating a graph representing said rendered image** ([Fig. 1], [0010], [0032], [0047], [0048], and [0073]); **Under control of said CPU** (Fig. 4, 410 - host processor), **starting with a root node in said graph** ([Column 5, lines 6-19]), **calling the following groups of objects for each node that must be calculated in order that the root node may be calculated** ([Column 5, lines 32-58]); **one or more objects for analyzing whether two programs may be combined, and performing a combination if said analysis is positive; one or more objects for creating a buffer and causing a GPU** (graphics controller) **to render an image to that buffer by running a program** ([Column 5, lines 50-67] and [Column 6, lines 1-22]). Strauss teaches the limitations of claim 23 above, however fails to specifically teach of wherein the programs are **GPU programs, and where there are one or more objects for performing DOD/ROI optimization.** Strauss does teach of wherein the optimization of the scene graph involves rearranging nodes based on their properties ([Fig. 5], [Column 5, lines 50-67], and [Column 6, lines 1-18]). Applicant defines ROI and DOD in [0117] in terms that they help the optimization of a section of data (according to shape). Considering each of the nodes have there own properties it would be obvious for one skilled in the art to have also termed each grouping of nodes that are rearranged in groups according to their properties (based on

shape). Beda teaches of optimizing the rendering of graphics through the optimization of storing and accessing information related to an image based upon a caching structure (scenic graph – ex. [0008]) dependent upon an animation engine (graphics processor). Considering Strauss teaches of a system and method for using scenic graphs in relation to image data but includes using extra processing power (graphics controller) and contains an optimization step (optimization of both the scene graph and rendering performance), it would have been obvious for one skilled in the art to have combine the teachings of Beda with those of Strauss. Doing so would provide the means for an image rendering system that optimizes the scene graph used for rendering the image, optimizing the rendering of the image (including having more processing power), and having a more structured storage and retrieval method.

35. As per claim 32, Beda and Strauss teach the limitations of claim 23 above, and Beda further teaches of **wherein said representation of said rendered polygon is a graph** ([Fig. 5] and [Abstract]).

36. As per claim 33, Beda and Strauss teach the limitations of claim 23 above, and Beda further teaches of **wherein said representation of said rendered polygon is a graph** ([Fig. 5] and [Abstract]).

37. As per claim 34, Beda and Strauss teach the limitations of claim 23 above, and Strauss further teaches of **receiving a request to render said image** ([Fig. 5], [Column 1, lines 63-67], and [Column 2, lines 1-13]).

38. Regarding claim 35, it is similar in scope to claim 34 and is rejected under the same rationale.

39. Regarding claim 36, Beda and Strauss teach the limitations of claim 31 above, however both Beda and Strauss fail to specifically teaches **of wherein said one or more objects for analyzing whether two GPU programs may be combined, and performing a combination if said analysis is positive, are recursively called until no more combinations are possible** even though it is tactical of optimization. Official Notice is taken that both the concept and the advantages of analyzing whether two GPU programs may be combined, and performing a combination if said analysis is positive, are recursively called until no more combinations are possible are well known and expected in the art. Thus, it would have been obvious for one skilled in the art, at the time of Applicant's invention, to have analyzed all of the different combinations of using the "programs" in the scene graph as to optimize the rendering of the scene graph and to optimize the rendering of the image based on the data in the scene graph therefore optimizing the rendering procedure.

40. As per claim 37, Beda and Strauss teach the limitations of claim 31 above, however both Beda and Strauss fail to specifically teach of wherein DOD/ROI optimization comprises **intersecting the ROI with the output DOD for a GPU program**. Strauss does teach of wherein the optimization of the scene graph involves rearranging nodes based on their properties ([Fig. 5], [Column 5, lines 50-67], and [Column 6, lines 1-18]). Applicant defines ROI and DOD in [0117] in terms that they help the optimization of a section of data (according to shape). Considering each of the nodes have there own properties it would be obvious for one skilled in the art to have also termed each grouping of nodes that are rearranged in groups according to their properties (based on shape). Furthermore, it would have been obvious for one skilled in the art to have determined if an image or visual information would be ready for display or use within a program as without it being ready it would not be able to be displayed.

41. As per claim 38, Beda and Strauss teach the limitations of claim 31 above; however, both Beda and Strauss fail to specifically teach of **wherein a cache is used in order to find the result of computed node without computing that node**. Beda teaches of optimizing the rendering of graphics through the optimization of storing and accessing information related to an image based upon a caching structure (scenic graph – ex. [0008]) dependent upon an animation engine (graphics processor) and further of pre-processing ([Abstract], [0011], [0047], and [0048]) therefore not running the program until the optimized program (or combination) has been discovered. Strauss teaches of a system and a method for optimizing a scene graph for optimizing the

rendering of an image ([Column 1, lines 63-67] and [Column 2, lines 1-13]). Strauss further teaches of containing a graphics controller (GPU) wherein rendering an object by executing the steps in the scene graph ([Fig. 3], [Column 1, lines 63-67], [Column 2-1-13], and [Column 2- lines 34-44]. Considering Strauss teaches of a system and method for using scenic graphs in relation to image data but includes using extra processing power (graphics controller) and contains an optimization step (optimization of both the scene graph and rendering performance), it would have been obvious for one skilled in the art to have combine the teachings of Beda with those of Strauss. Doing so would provide the means for an image rendering system that optimizes the scene graph used for rendering the image, optimizing the rendering of the image (including having more processing power), and having a more structured storage and retrieval method.

42. As per claim 39, Beda and Strauss teach the limitations of claims 8, 20, 23, and 31 above, and Beda further teaches of **a computer-readable medium having computer executable instructions for performing the method recited in any one of said claims** ([0002] and [0015]).

43. Claims 23, 24, and 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,896,139 (Strauss).

44. As per claim 23, Strauss teaches of a method for creating a rendered polygon (visual information), the method comprising the steps of: **Under control of a CPU** (Fig. 4, 410 - host processor)**, receiving a request to render a polygon** (triangle); Under control of said CPU, creating a representation of said rendered polygon comprising **a root program** (VRML) ([Column 5, lines 6-19]) **and its relationship with other programs** (several programs) ([Column 1, lines 48-60])**, their inputs and outputs; Under control of said CPU, starting with the root program, calling the following groups of objects for each program that must be run in order that the root program may run to render said polygon** ([Column 5, lines 32-58])**; one or more objects for analyzing whether two programs may be combined, and performing a combination if said analysis is positive; one or more objects for creating a buffer and causing a GPU** (graphics controller) **to render an image to that buffer by running a program** ([Column 5, lines 50-67] and [Column 6, lines 1-22]). Strauss teaches the limitations of claim 23 above, however fails to specifically teach of wherein the programs are **GPU programs, and where there are one or more objects for performing DOD/ROI optimization.** Strauss does teach of wherein the optimization of the scene graph involves rearranging nodes based on their properties ([Fig. 5], [Column 5, lines 50-67], and [Column 6, lines 1-18]). Applicant defines ROI and DOD in [0117] in terms that they help the optimization of a section of data (according to shape). Considering each of the nodes have there own properties it would be obvious for one skilled in the art to have also termed each grouping of nodes that are rearranged in groups according to their properties (based on shape).

45. As per claim 24, Strauss teaches of wherein said **representation of said rendered polygon** (triangle) **is a graph** (scene graph) ([Fig. 5], [Column 5, lines 50-67], and [Column 6, lines 1-18]).

46. As per claim 27, Strauss teaches the limitations of further wherein an application **program under CPU control makes said request to render said polygon** ([Fig. 5], [Column 1, lines 63-67], and [Column 2, lines 1-13]).

47. Regarding claim 28, Strauss teaches the limitations of claim 23 above, however Strauss fails to specifically teach **of wherein said one or more objects for analyzing whether two GPU programs may be combined, and performing a combination if said analysis is positive, are recursively called until no more combinations are possible** even though it is tactical of optimization. Official Notice is taken that both the concept and the advantages <u>of analyzing whether two GPU programs may be combined, and performing a combination if said analysis is positive, are recursively called until no more combinations are possible</u> are well known and expected in the art. Thus, it would have been obvious for one skilled in the art, at the time of Applicant's invention, <u>to have analyzed all of the different combinations of using the "programs" in the scene graph as to optimize the rendering of the scene graph and to optimize the rendering of the image based on the data in the scene graph therefore optimizing the rendering procedure.</u>

48. As per claim 29, Strauss teaches the limitations of claim 23 above, however Strauss fails to specifically teach of wherein DOD/ROI optimization comprises **intersecting the ROI with the output DOD for a GPU program**. Strauss does teach of wherein the optimization of the scene graph involves rearranging nodes based on their properties ([Fig. 5], [Column 5, lines 50-67], and [Column 6, lines 1-18]). Applicant defines ROI and DOD in [0117] in terms that they help the optimization of a section of data (according to shape). Considering each of the nodes have there own properties it would be obvious for one skilled in the art to have also termed each grouping of nodes that are rearranged in groups according to their properties (based on shape). Furthermore, it would have been obvious for one skilled in the art to have determined if an image or visual information would be ready for display or use within a program as without it being ready it would not be able to be displayed.

49. Claims 25, 26, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,896,139 (Strauss) in view of U.S. Publication No.: US 2003/0076329 A1 (Beda).

50. As per claim 25, Strauss teaches the limitations of claim 23 above and of **wherein said representation of said rendered polygon is a graph** ([Fig. 5] and [Abstract]). Strauss fails to specifically teach of wherein the graph is a **low-level** graph.

Beda teaches of optimizing the rendering of graphics through the optimization of storing and accessing information related to an image based upon a caching structure (scenic graph – ex. [0008]) dependent upon an animation engine (graphics processor) wherein the graph has both low level and high level components ([Fig. 3], [0048], and [0049]). Strauss teaches of a system and a method for optimizing a scene graph for optimizing the rendering of an image ([Column 1, lines 63-67] and [Column 2, lines 1-13]). Strauss further teaches of containing a graphics controller (GPU) wherein rendering an object by executing the steps in the scene graph ([Fig. 3], [Column 1, lines 63-67], [Column 2-1-13], and [Column 2- lines 34-44]. Considering Strauss teaches of a system and method for using scenic graphs in relation to image data but includes using extra processing power (graphics controller) and contains an optimization step (optimization of both the scene graph and rendering performance), it would have been obvious for one skilled in the art to have combine the teachings of Beda with those of Strauss. Doing so would provide the means for an image rendering system that optimizes the scene graph used for rendering the image, optimizing the rendering of the image (including having more processing power), and having a more structured storage and retrieval method.

51. As per claim 26, Strauss teaches the limitations of claim 23 above and of **wherein said representation of said rendered polygon is a graph** ([Fig. 5] and [Abstract]). Strauss fails to specifically teach of wherein the graph is a **high-level** graph. Beda teaches of optimizing the rendering of graphics through the optimization of storing and accessing information related to an image based upon a caching structure (scenic

graph – ex. [0008]) dependent upon an animation engine (graphics processor) wherein the graph has both low level and high level components ([Fig. 3], [0048], and [0049]). Strauss teaches of a system and a method for optimizing a scene graph for optimizing the rendering of an image ([Column 1, lines 63-67] and [Column 2, lines 1-13]). Strauss further teaches of containing a graphics controller (GPU) wherein rendering an object by executing the steps in the scene graph ([Fig. 3], [Column 1, lines 63-67], [Column 2-1-13], and [Column 2- lines 34-44]. Considering Strauss teaches of a system and method for using scenic graphs in relation to image data but includes using extra processing power (graphics controller) and contains an optimization step (optimization of both the scene graph and rendering performance), it would have been obvious for one skilled in the art to have combine the teachings of Beda with those of Strauss. Doing so would provide the means for an image rendering system that optimizes the scene graph used for rendering the image, optimizing the rendering of the image (including having more processing power), and having a more structured storage and retrieval method.

52. As per claim 30, Strauss teaches the limitations of claim 23 above, and of finding **the result of running a GPU program.** Strauss fails to specifically teach of **wherein a cache is used in order to find the result of running a program, without running that program**. Beda teaches of optimizing the rendering of graphics through the optimization of storing and accessing information related to an image based upon a caching structure (scenic graph – ex. [0008]) dependent upon an animation engine (graphics processor) and further of pre-processing ([Abstract], [0011], [0047], and

[0048]) therefore not running the program until the optimized program (or combination) has been discovered. Strauss teaches of a system and a method for optimizing a scene graph for optimizing the rendering of an image ([Column 1, lines 63-67] and [Column 2, lines 1-13]). Strauss further teaches of containing a graphics controller (GPU) wherein rendering an object by executing the steps in the scene graph ([Fig. 3], [Column 1, lines 63-67], [Column 2-1-13], and [Column 2- lines 34-44]. Considering Strauss teaches of a system and method for using scenic graphs in relation to image data but includes using extra processing power (graphics controller) and contains an optimization step (optimization of both the scene graph and rendering performance), it would have been obvious for one skilled in the art to have combine the teachings of Beda with those of Strauss. Doing so would provide the means for an image rendering system that optimizes the scene graph used for rendering the image, optimizing the rendering of the image (including having more processing power), and having a more structured storage and retrieval method.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aaron M. Guertin whose telephone number is 571-270-1547. The examiner can normally be reached on M-F 8:30AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Xiao Wu can be reached on 571-272-7761. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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